

ART. XIII.—*Rélation Médico-Chirurgicale de la Campagne d'Orient, du 31 Mars, 1854, occupation de Gallipoli, au 6 Juillet, 1856, évacuation de la Crimée.* Par le Dr. G. SCRIVE, Médecin-inspecteur de service de santé des armées, ex-médecin en chef de l'armée d'Orient, &c. &c. Paris, 1857. 8vo. pp. 485.

A Medico-Chirurgical Account of the Crimean War, from the first arrival of the troops at Gallipoli, to their departure from the Crimea. By Dr. SCRIVE, Surgeon-General of the Army in the Crimea.

THE study of the medical and surgical history of the English and French armies engaged in the Crimean war is eminently instructive. The collection of a very large number of troops in a small territory, and the stability imposed upon them by the necessities of the principal object of the enterprise—the taking of Sebastopol—while they were at the same time actively engaged and living as soldiers in a campaign, afforded a most complete opportunity of observing the development of the diseases of armies, with their special etiology and pathology. The presence side by side of the two independent armies, which, though engaged in the same enterprise, were completely separate in their organization, and at times very differently occupied, gave, moreover, an unusual opportunity of judging what part climate and season had in causing these special affections, and what part must be assigned to the abnormal conditions inherent to the life of a soldier. In surgery, also, the experience afforded by the campaign was most extensive. The number of serious gunshot wounds that occurred was enormous. The world never before witnessed such a display of physical and material force exerted for so long a time, for purposes of destruction.

The volume of Dr. Scrive gives a very complete medical and surgical history of the French troops engaged in the Crimean war during its whole period. From this history we design to take those facts and reflections that appear to us most interesting and most useful; when appropriate, we shall connect with them those given elsewhere by English observers, regarding the English troops; and we shall do this with reference to the actual condition of affairs in this country.

The Crimean war lasted, without any intermission, winter and summer, for twenty-four months. The total number of French troops sent to the East, at different times, amounted to 309,268 men, of whom 200,000 entered the ambulances and hospitals to receive medical aid; 50,000 for wounds, and 150,000 for diseases of various kinds. The total mortality was 69,229, or $22\frac{1}{3}$ per centum. Of these, 16,320 died of wounds, and nearly 53,000 from diseases. It is of these diseases we wish to speak first, and we shall see at once what part climate had in their causation and their fatality, and what part the peculiar conditions of a soldier's life. The following table, taken from page 345 of Dr. Scrive's book, giving the statistics of the ambulances of the Crimea, will greatly aid in the comprehension of this question:—

	Entered.	Discharged.	Sent to Constantinople.	Died.
Officers wounded, ordinary wounds . . .	135	104	31	None.
Officers with gunshot wounds . . .	1,625	740	770	115
Officers with fever	1,098	401	503	194 ¹
Soldiers wounded, ordinary wounds . . .	5,582	3,168	2,154	260 ²
Frostbites	5,596	2,012	3,472	112
Soldiers with gunshot wounds . . .	35,912	10,178	22,121	3,613 ³
Intermittent fever	6,983	3,746	3,197	40 ⁴
Remittent fever	12,267	4,036	6,436	1,795 ⁵
Pernicious fever	275	73	52	150 ⁶
Typhoid fever	6,351	1,060	1,628	3,663 ⁷
Typhus	11,124	1,266	3,840	6,018
Diarrhœa	19,339	5,240	12,115	1,984 ⁸
Dysentery	6,105	1,252	2,792	2,061 ⁹
Cholera	12,258	3,049	3,196	6,013
Scurvy	23,365	4,550	17,576	639 ¹⁰
Feverish	42,453	6,902	34,420	1,731
Venereal	1,455	1,201	241	13 ¹¹
Itch	1,255	1,128	124	3 ¹²
	193,178	50,106	114,668	28,404

If we follow those sent from the ambulances of the Crimea to the hospitals of Constantinople, we have (at page 485) the following statistics:—

	From Varna and the Crimea.	By ticket.	Went out.	Sent to hospitals in Turkey or in France.	Died at Constantinople.
Wounded, ordinary wounds	2,185	1,007	2,059	720	413
Wounded by gunshot . . .	22,891	None	9,619	8,190	5,085
Frostbitten	3,472	142	2,009	775	830
Typhus	3,840	4,889	3,544	1,778	3,407
Cholera	3,196	2,570	2,529	1,076	2,161
Scurvy	17,576	3,851	9,587	8,460	3,380
Feverish	63,124	8,038	35,625	22,988	12,549
Venereal	241	2,597	2,316	522	None
Itch	124	156	256	24	None
	116,649	23,250	67,541	44,533	27,825

Nearly 5,000 men died at Varna, at Gallipoli, and other places, before the troops reached the Crimea, a very large majority of them from the fearful outburst of the cholera in the Dobruscha. This number, added to 7,500, the number of those who were killed in engagements, or disappeared, together with those who died in the ambulances and hospitals, as stated above (56,229), gives the whole number lost by the French army.

Inspection of these tables shows that a very large proportion of the whole mortality is attributed to cholera, to typhus, and to scurvy, and great as it is, the true proportion of deaths directly caused by their presence in

¹ Many died of typhus and of cholera. ² Complicated with typhus.

³ Complicated with cholera, typhus, and scurvy.

⁴ From complications.

⁵ Often complicated with typhus.

⁶ Complicated with cholera and typhus. ⁷ Many of these cases were typhus.

⁸ Complicated with cholera and scurvy. ⁹ Idem.

¹⁰ Complicated with typhus.

¹¹ From complications.

¹² Idem.

the army is very much greater, for all other diseases as also the wounds, to a very considerable extent owed their fatality to complication with one or more of these three affections. In the whole campaign Dr. Scrive says that 11,000 men died of cholera out of 18,400 cases (p. 406). The total number of deaths owing to typhus he computes at nearly 18,000 out of 35,000 cases (p. 421). The loss from scurvy, according to the tables given above, is but little over 4,000; yet while it only exceptionally caused death of itself, the consequences of its invasion upon the troops were most disastrous, by preparing the ground for other affections which, associated with scurvy, gave rise to a very large proportion of the mortality (p. 428). Another consequence of the presence of the scorbutic influence was the loss to the army, for several months, the time required for its treatment, of the services of a very large number of the oldest and best trained soldiers, who were those principally attacked. As is seen above, over 23,000 cases of scurvy entered the ambulances of the Crimea.

Now of these diseases typhus and scurvy are undoubtedly *preventable*: that is to say, they are the effect of the action of causes that are known and that are under our control. Climate and season may interfere with our power of acting upon the causes of these diseases, but that is as far as their influence extends in the matter of their production. With proper food, good clothing, pure air, cleanliness, and sufficient rest, neither scurvy nor typhus fever can arise.

In cholera, the effect of the influence of the peculiarities and hardships of the soldier's life was seen, not in producing the disease as in scurvy and in typhus, but in enormously increasing its mortality. Cholera acquires an extraordinary power of destruction by association with ordinary great disturbing and disorganizing morbid causes, as ill-ventilated habitations, the concentration of animal and vegetable miasmata, overcrowding, great fatigue, excited passions, and painful privations—in other words, with the conditions almost necessarily attending the life of the soldier in active service.

It was while making forced marches, in the end of July, through the Dobruscha, a country without any resources, and infected with marsh miasma, that the cholera made its appearance among the French.¹ By

¹ We cannot here go into any particulars in regard to this fearful epidemic. To give an idea of its violence, we may state that in one day, in a single regiment, 300 men were attacked, almost all fatally. We will be excused, however, for copying from Dr. Scrive's work the following picture of the landing of the suffering troops, on their return from the Dobruscha, at Varna, where they were carried on steamers: "I never assisted at a more frightful spectacle than the one we witnessed on the beach at Varna, when these poor soldiers were landed, rendered unrecognizable by the terrible pestilence that had attacked them. Once in particular, it was evening, and the uncertain light of the moon added still more mournful shades to the picture. The sick were hoisted from the boats by sailors and deposited on the sand of the beach; some, completely collapsed, allowed themselves to fall heavily; others having preserved a remnant of strength, walked a few steps like drunken men, or crawled along on their hands, and soon fell motionless in their turn, from complete exhaustion of their strength. Some were naked, or almost naked, or only with pieces of dress thrown over them that did not belong to them. Officers and private soldiers lay together pellmell on the sand; all ranks were confounded in the presence of death. Many of them begged for drink in that broken, sepulchral voice peculiar to the disease; others cried out or groaned from the excruciating pain of the cramps. Those who died while being carried ashore were placed in a line on the bank, each one in the position in which the agony of death had left him." (pp. 79, 80.) What a picture this would be for the pencil of the great artist who represented the cholera on board of the Melpomène!

practising the three great principles of complete isolation, constant aeration, and permanent dissemination of the men affected, its ravages were checked at once. Three months afterwards, in the Crimea, after the battle of the Alma, the army was forced, from want of provisions, to remain on the field, which was covered with dead horses, putrefying and giving out an insupportable odour. The cholera burst out again. The climate of the Crimea was far from being favourable to the spread of cholera; on the contrary, again and again, when carried there by the arrival of troops from France and Turkey, it disappeared in a few days from the lack of conditions favourable to its development. (Scrive, page 86.)

In fact, with the exception of the intermittent fevers caused by encamping for a period of time in the neighbourhood of the marshes of the Tchernaiâ, fevers which when uncomplicated yielded promptly to simple treatment, there was nothing in the diseases of the French army that could be laid to the account of the climate of the Crimea, which is analogous to that of Corsica, of Italy, and of the south of France.¹ The extreme seasons, winter and summer, could have had no particularly bad influence upon the health of the troops, had they not been undergoing the fatigues, privations, and hardships of war. It can safely be concluded, therefore, both from the nature of the diseases by which the French soldiers were destroyed, and also from the universally admitted salubrity of the climate of the Crimea, that the great mortality among them was dependent upon causes inherent to the life of a soldier, in an active campaign, by which are comprised life in camp, the food furnished to an army, the clothing, the habitations, the concentration of large masses of men, and the fatigues, hardships, and moral effects of a war.

Very strong additional proof of the predominating influence of these particular causes in the production of disease during the Crimean war, is to be deduced from a consideration of the relative conditions of the English army at the beginning and at the end of the campaign. The English sent to the Crimea 93,959 men. Of these there were killed in action and died of wounds 4,446; the deaths from disease were 16,298; and 12,903 were invalided. The whole mortality was therefore over 22 per cent., or nearly the same as that in the French army. Now at least five-sixths of this mortality occurred during the first six months, from typhus, scurvy, frost-bite, dysentery, and diarrhœa, which had one common origin, namely, the exhaustion of the vital powers from overwork, inadequate night-rest, unsuitable clothing, inappropriate shelter against wet and cold, scarcity of fuel for cooking, unwholesome food, and insufficient nutriment. At the same time that the soldiers were dying so rapidly, the officers, exposed to the same weather and influences of climate, were more healthy in the Crimea than in England. During the second winter the health of the men was so perfect, that in the month of January, the deaths were only 124 in all the hospitals, regimental and general, in the Crimea and on the Bosphorus. The report for the week ending the 15th March, gives 70,409 as the total number of troops, of whom only 3,747 were under medical treatment, and the fatal cases on these seven days numbered only 19. At this time the influences of climate were the same, but the whole army was well clothed,

¹ To prevent as much as possible the action of the miasma from the marshes, the orders of Dr. Scrive were to keep up fires around the camp at night, to commence work late in the morning, to supply food and tonic drinks before proceeding to work, to wear flannel, to hermetically close the tents at night, to provide good food, and to allow the men to rest frequently while engaged in hard labour.

well sheltered, and fed; while the military duties of the men served only for healthy bodily exercise.

These facts in regard to the condition of the English forces we have taken from the several articles published in the *British and Foreign Medico-Chirurgical Review*, at the time of the Crimean war, or soon after its termination. In one of these articles, and a very ably written one it is, styled "The Allied Armies before Sebastopol,"¹ the writer discusses the question of the relative merits and demerits of British and French military administrative regulations in preserving and restoring the efficient health of soldiers in the field, and the conclusion to which he comes is that the extraordinary sanitary condition of the British troops during the last winter in the Crimea, while the French army was reduced three-fourths in numbers and efficiency by camp sickness, hospital destitution, and the failure of its medical administrative resources, is mainly due to the great superiority of the British military organization. Such a conclusion is, to say the least, a very unwarrantable one; but it was published when the war was over, and could produce no injurious effect, while it would be gratifying to see it proclaimed. In the beginning of the war, in the same Review (in the number for April, 1855) we read as follows:—

"The deeply humiliating spectacle has been exhibited of a British army, unequalled in daring and discipline, perishing of want in the vicinity of abundance; naked and tattered within sight of stores of clothing; clothed, fed, and transplanted when sick, by a gallant and generous ally, to whose superior organization it owes its very existence."

Most unquestionably the true reason for the superior health of the English troops during the second winter is given by the reviewer himself a few pages preceding, where he says—as we have repeated above—that the whole army at that time "was well clothed, well sheltered, and fed; while the military duties of the men served only for healthy bodily exercise."

In fact, after the destruction of Sebastopol, in September, the English did no more than make themselves comfortable, while protected by the marches and counter-marches of the French. While the latter, a gun in one hand and a pickaxe in the other, were fortifying and defending a line of more than twelve leagues from Sebastopol to Baidar, three-fourths of the men on the watch all the time from constant alarms, obliged to go far to seek their wood, water, and provisions, the thermometer sometimes down to zero, and once even eleven degrees below (-24° Centigrade), with only *tentes creusées* and *huttes en torchis* for their habitation, the English were most comfortably installed in well constructed wooden barracks, thoroughly warmed and ventilated, well paved roads, and even railroads, bringing an abundance of fuel and provisions into the camp, and so many labourers from Turkey, Greece, and England, to do all the hard work of the camp that they equalled in number one-half of the army.

It does not accord with our object in writing this article to discuss at all the relative merits of the organizations of the French and English armies. It is, we are firmly convinced, a fact that cannot fairly be questioned that the greater mortality of the French army during the last winter was owing to the conditions we have just given, or in other words, to their being more exposed, and to an extraordinary degree, to the deleterious causes of disease inherent to a soldier's life, and we believe, moreover, this great mortality fell upon them in spite of their organization, of the cha-

¹ In the number for January, 1858.

acter of which we have seen the English writer bear witness, since he states its superiority to have saved the perishing British army.

The French military surgeons are eminently qualified for contending against the diseases peculiar to armies. They pass through a long course of study in special schools and hospitals, and they have had ample practical experience in their constant wars in Algeria and elsewhere. Their scientific merits, ardent zeal, self-denial, and absolute devotion, as manifested throughout the whole Crimean war, are beyond all praise. No suffering soldier ever wanted a dressing, a remedy, or a consolation. Of 550 that were necessary during the campaign, 83 were killed or died from disease. Dr. Scrive says, moreover, that there was not one single judicious measure advised by the surgeons that was not at once ordered to be executed by the chief of the administration.

If, therefore, during this war, notwithstanding all the skill and zeal of the medical men, eagerly seconded by the administration, the mortality from diseases was enormous, and these diseases were nevertheless mainly of a kind known as *preventable*, we see how very difficult it may become in an active campaign to overcome their causes, preventable though they be, and how readily armies are affected by them. These causes, as already said, are the vitiation of the air from over-crowding and from want of strict attention to cleanliness, improper food, imperfect protection from habitations, insufficient clothing, and over-fatigue. We will examine as briefly as possible the measures enforced by Dr. Scrive for counteracting these causes, and wherein and why these measures failed.

The greatest care was always taken by the surgeons that there should be a sufficient space between the tents to allow of free circulation of air; and that the kitchens, the stables, and the privies were removed to a sufficient distance. Every morning early, if the weather permitted, the clothing and bed coverings of the soldiers were exposed outside the tents, which were left widely opened, in order to allow the complete aeration of the ground, and of their being swept. In some places twice a week the tents were taken down in order to expose the ground most fully to the sun and air; in other places, this was not done so often. The rubbish of all kinds was every day taken to a distance from the camp and burned. Spots of infection in the neighbourhood of the camp were destroyed when possible by burning; if not possible, the disinfecting properties of sulphate of iron were resorted to. The sulphate was dissolved in water, in the proportion of one to fifteen, by weight, and three quarts were used to every square yard of ground. The burials were made three feet deep; if the nature of the ground was such as to make this impossible, the bodies were covered with quick-lime. The products of the slaughter-houses and of the sewers were treated in the same way. The tents or barracks were disinfected by using a solution of chloride of lime, one part of the chloride to twelve of water, stirred, and left to settle; one wineglassful of the clear liquid was placed in the tent, and this was done in the morning, so that the exhalation of chlorine might not annoy the men while sleeping. The tubs serving as privies had, every day after they were cleaned, a quart of the solution of the sulphate of iron thrown into them. Men attacked with infectious or contagious diseases were completely isolated from the others, disseminated here and there, and provided abundantly with fresh air. When lightly attacked with typhus, six or eight cases were placed in a tent for sixteen men; when seriously attacked, only four. In cold weather a coal

fire was kept brightly burning in the centre of the hospital tents or barracks for purposes of warmth and ventilation.

The food given to each soldier was, for every day—

Bread, 750 grammes ($1\frac{1}{2}$ lbs.), or biscuit, 550 gr. (nearly $1\frac{1}{8}$ lb.). Meat, 300 grammes (nearly 10 oz.), or salted pork (a little over $\frac{1}{2}$ lb.). Rice, 60 gr. (nearly 2 oz.). Sugar, 20 gr. (a little over $\frac{5}{8}$ oz.). Coffee, 16 gr. (a little over $\frac{1}{2}$ oz.). Salt, 16 gr. (a little over $\frac{1}{2}$ oz.).

Fresh meat was given four days in ten; salt pork, three days; and three days, preserved meat. The sick had fresh meat every day. An extra ration of wine was given every day, and also an extra ration of 100 grammes (a little over 3 oz.) of biscuit. Three times a week a quarter of a litre (or more than half a pint) of wine, or in its place one-sixteenth (a little over f $\frac{3}{16}$ ij) of brandy four times a week. Rice, beans, sugar, coffee, potatoes, and onions were sometimes given as substitutes to other things.¹ The dandelion, which grows very abundantly in the Crimea, was eaten as salad whenever it could be procured. When there was none to be had, in the severe cold of winter and the long-continued droughts of summer, its influence in preventing scurvy was manifest to a most surprising degree.

The whole army during the second winter, when the sickness was greatest, was in under-ground huts or under large tents; the small-sized ordinary tent was no longer used.

As to their covering, every man had a *criménne* (a sort of hood), gloves, socks, long stockings of wool, Bulgarian gaiters, *chéchias*, wooden shoes, and overcoats of sheepskin for mounting guard and for any extra duty.

During the second winter, when the sickness was greatest, the French army was compelled to defend a line of more than twelve leagues. At every moment there were alarms keeping under arms three-fourths of the men. The enormous extent of the line of defence, requiring daily numerous *avant-gardes* and *grand' gardes*, rendered the provisioning of the army both difficult and fatiguing, and spread it out over all kinds of ground favourable or not to a winter encampment. In other words, the French troops were then subjected to excessive fatigue, in the most inclement season of the year, and in camping-grounds often wet and unhealthy; with habitations quite insufficient to protect them from intense cold, the humidity entering by the floor, the sides, and the roof, and containing too many men, thus reuniting the most favourable conditions to the production of cachectic and infectious diseases.

According to Dr. Scrive, the food of the French soldier, which, as is seen, does not differ materially from that of our own, should be reformed. When the live stock following the army became diseased, as was the case when it was attacked both by cholera and by typhus when these epidemics prevailed among the troops, or could not be transported to the seat of war, as was the case when the navigation in the Black Sea was prevented by violent storms, salted meat was all they had. Salted food, Dr. Scrive says, should be banished as much as possible from the provisioning of armies. The great progress of alimentary chemistry furnishes, at the present day,

¹ The daily ration of the American soldier, which we place here for facility of comparison, is: Pork $\frac{3}{4}$ lb., or $1\frac{1}{4}$ lb. of fresh or salt beef. Flour 18 oz., or hard bread 12 oz., or $1\frac{1}{4}$ lb. of corn-meal. And for 100 rations he receives 8 quarts of peas or beans, or 10 lbs. of rice, 6 lbs. of coffee, 12 lbs. of sugar, 4 qts. of vinegar, and 12 qts. of salt. In campaigns, the quantity of hard bread is increased to 1 lb. Fresh beef is required to be furnished as often as the commanding officer may require, or at least twice a week.

precious resources from which great profit might be drawn for the health of soldiers. If fresh meat cannot be had, it should be replaced by preserved juice of meat, concentrated soups, and boiled beef. These, he says, rendered accidentally immense service at the end of the Crimean war. He advises, moreover, that fresh vegetables, reduced by desiccation to a very small size, and which, with proper care, can be thus indefinitely preserved, should be regularly served in the rations of soldiers in active service, in equal parts with the rice and peas or beans. In this way a variety of food absolutely requisite to the human organization would be furnished, and the soldiers would be infallibly preserved from the scurvy. In modern times no case of scurvy need ever occur at any season of the year in an army, provided, of course, its communications are kept open.

Prophylactic measures against typhus are far more difficult of execution in an army, and sometimes, as in the Crimea during the second winter, they are impossible. Nevertheless, every possible sacrifice must be made to prevent its being engendered. Excessive fatigue must be avoided, the food must be good and the water drinkable, rules of general and individual cleanliness must be imposed, and the men must be placed where they will breathe a pure and renewed air. When it does break out, those attacked must be separated from the rest and scattered here and there in the most healthy spots that are accessible. In the Crimea, during the last winter, human means could do nothing; the weather prevented hygienic measures almost entirely, and there was no possibility of transporting the sick to other places, on account of the storms in the Black Sea. As to the extraordinary fatigues and hardships undergone by the French soldiers, these were rendered absolutely necessary by the exigencies of the war.

Together with the large armies sent by England and France to the Crimea, was a force of 12 or 15,000 men furnished by Sardinia. Their military organization is almost exactly the same with the French, and we see nothing additional to what we have already stated to be learned from their sanitary condition, except the great advantage they had, according to Dr. Serive, from giving the entire direction of the hospitals, as regards the arrangements of the sick, the furniture, the kitchen, the pharmacy, &c., to the Sisters of Charity, who, he adds, can never be replaced by men, who have not the same feelings as women, above all, women animated by the sentiments actuating the Sisters of Charity.¹ (p. 302.)

Having now become acquainted, from the study of the medical history of the Crimean war, with the diseases from which an army in the field is liable to suffer, and with the extent to which it may suffer under unfavourable circumstances; and also with the causes of these diseases and the means to be adopted for their prevention, it remains for us to make what use we can of the information thus derived, and to endeavour to profit by it.

It is to be remarked, that all those difficulties to the removal of the causes of these diseases, dependent upon the great distance of the seat of war from the mother country, do not exist in this country, under present circumstances. It is only from ignorance, from want of zeal in the discharge of duty, or from fraud, that our men can be led to suffer in provisions, clothing, medical care, or hospital attendance. Well fed, well clothed, and protected from the weather, and properly cared for by the medical officers, no amount of

¹ While cordially agreeing with what Dr. Serive says of Sisters of Charity, we think it necessary, in order to avoid misunderstanding, to declare that there are serious objections to the employment of female nurses for soldiers. The experience of military surgeons has fully settled this question in the minds of medical men.

fatigue they will be called upon to undergo, can ever be so long continued as to exhaust their vital powers and lead to a great epidemic. Upon those employed in furnishing, receiving, and distributing the necessary supplies of every kind for the army, and upon the medical officers attached to it, will depend, therefore, the health of our troops. As to the soldiers themselves, it is well known as a rule all the world over that they abandon themselves recklessly to the various chances of their fortune, good or bad, live from day to day, and neglect every precaution for preserving health. They require everywhere a superior direction, regulating by discipline all the physical and moral acts of their life. As to our volunteers, in the war with Mexico, we see that in a ten months' campaign the total loss was 21.31 per cent., or 2.13 per cent. a month, and their loss from disease relatively to that of the regulars was as 4.7 is to 1.

The necessity of scrupulous care in the selection of the medical men attached to our army is therefore most evident. In the way in which diplomas are given in this country, men become members of the medical profession who are altogether unequal to the duties they may be called upon to perform, even in ordinary circumstances. In civil practice this is not of very great importance, for the beneficial effects of competition correct the mischief. The public is at liberty to choose, and it is in a great measure their own fault if they suffer from falling into incompetent hands. The soldier, however, has no option in the matter, and he must submit to whatever the government may give him. A quantity of gilt-cording attached to their clothes, and the possession of two or three little books professing to treat of military surgery, though they are so small as to be readily carried in the pocket for easy reference, cannot render all the members of our profession fit for the duties they are to be called upon to perform. Before receiving an appointment in the army, they should be carefully examined by competent men. Moreover, we feel called upon to declare, that to preserve the health of the troops, it will be absolutely necessary to place every thing relating to their hygiene in the hands of members of the medical profession who have devoted their lives to such studies. Political demagogues, fanatical ministers, and strong-minded women, should be sternly repelled from intruding here. Too many lives, too great interests are now at stake.

Though our main object in writing this article is to call attention to the diseases by which armies are disabled, and to the means of preventing them, we will, before closing, make some brief extracts from what Dr. Scrive says on the subject of military surgery, or upon the care to be given to the wounded in engagements, and the treatment of gunshot wounds.

When the troops were engaged in besieging Sebastopol, as the wounded were brought in from the trenches they were directed by the administrative officer on guard into the tents of *waiting*, attached to the ambulances.¹ They were deposited in these tents in the order of their position as they became gradually filled, and in each tent they were placed in a regular order from right to left beginning at the entrance. One or more surgeons visited rapidly the wounded thus placed, and those whose wounds appeared to demand a severe operation were transported at once to two tents spe-

¹ An ambulance in the French service means an establishment for the temporary succour of the sick and wounded. It follows the movements of the troops for the purpose of affording the first attentions necessary. Each ambulance has at its disposal eighteen complete tents, a large quantity of bed furniture, and six hundred dressings for the wounded. Thirty-four men are attached to it, surgeons, apothecaries, administrative officers, and male nurses.

cially designed for the purpose. Simple dressings, or small operations to be quickly performed, were then executed, following the order in which the wounded had entered. The amputations and capital operations were performed afterwards when the crowding had ceased and the time they required for their careful performance could be more conveniently bestowed upon them.

At the taking of the Malakoff, when, as was anticipated, the number of wounded was very great, the medical service in the ambulances of the trenches was thus constituted: on the left were ten surgeons, and in addition an *ambulance volante* to follow the assaulting columns; on the right, twelve surgeons together with an *ambulance volante* composed of four surgeons; at Karabelnaïa, ten surgeons and a third *ambulance volante*. As the wounded were brought in, they were placed regularly in groups; each group was dressed by a surgeon having under his orders two assistant surgeons, and three male nurses, one to carry apparatus, the second to assist the surgeons, and the third to write on a paper prepared beforehand the information given by the wounded man as to his name, his first names, his regiment, and his number, and also whatever the surgeon might indicate as to the nature of the wound. The wounded, so soon as dressed, were sent on litters or *cacolets* to the division ambulances. Those upon whom serious operations were thought necessary were carried to one place where certain surgeons especially appointed to this purpose performed these operations. The assault commenced on the 8th September, at half past twelve in the afternoon. At Karabelnaïa 900 wounded, and on the right 1,800 were thus attended to in less than eight hours; on the left, where the fighting began some two hours later, 660 were attended to in six hours, and by eight o'clock in the evening the division ambulances had each received its allotted share. On the right, where the struggle had been hardest, the wounded continued to be carried in during the whole night, and even on the following day. The whole number of wounded thus cared for at the capture of the Malakoff was 5,000, of whom 400 were Russians. By the 10th of September all the wounded had been dressed for the second time, and of 550 capital operations to be performed, 350 were already done.¹

Among the gunshot wounds received in the Crimea were many of a new kind, produced by cylindro-conical balls, about which there was but little experience before that campaign.² The extreme swiftness of these balls makes them go through any organic tissue, however dense and resistant, without deviating from their course. In cases where soldiers were struck, creeping on the ground, these balls went straight from one end of a limb to the other, through bone and all, without changing their direction. Macleod, in his *Notes on the Surgery of the War in the Crimea*, says that one of these balls never comes to mark a bone with any touch more gentle than what occasions its utter destruction. The consequence of these wounds, according to Dr. Scriver, is a traumatic inflammation extremely violent, extending over a vast surface, leading frequently to strangulation and gan-

¹ The number of medical men upon whom this heavy labour fell was only 80, and they were compelled at the same time to attend to more than 5,000 other patients, sick and wounded, already in the ambulances. There was but one medical man to every 130 patients, and there should always be two to every 100.

² The rifle used by the Russians, according to Macleod, was little inferior in range or force to the Minié, while its conical deep-cupped ball was much heavier. Their range was 1,200 yards, and the weight of the ball 1 oz. 6 drachms; the Enfield ball weighs but 1 oz. 2 scruples.

grene, and forcing the surgeon, if the injury be to a limb, to have recourse to the last means of saving life, to amputation.

In the treatment of the wounded among the French it was found necessary to have recourse at an early period to good, strong meat soups, roast meat, and generous wine; Port wine, above all, was used with great benefit.

As regards the local treatment of wounds: the immediate extraction of foreign bodies was always the general rule with the French surgeons. In cases of hemorrhage, the ligature was used for the obliteration of large vessels; astringents and cauterization for hemorrhage *en nappe*. Of all astringents, the most efficacious were solutions of the perchloride of iron and of the persulphate of the same metal. These salts, Dr. Scrive says, are worthy of being introduced into the materia medica of armies. The favourable results that followed the practice of removing constriction by long and deep incisions demonstrated the real benefits of the preventive dilatation of wounds. This practice, formerly so much insisted upon, has been generally abandoned of late years. Its advantages in remedying strangulation, excess of inflammation, the stagnation of pus and traumatic gangrene were seen in numerous instances.

The experience acquired in the Crimea on the interesting questions concerning amputations shows that, in war, these means of last resource must be largely applied. "If," says Dr. Scrive, "you hesitate in cases that appear doubtful, or if you place yourself a little too much on the ground of what is called conservative surgery, you are not long in repenting of it, and in seeing wounded men die in consequence of wounds that often amputation would have been able to save. Too often we made this sad experiment." (P. 461.) The same is the opinion of the English surgeon, Macleod, who says that it can hardly be doubted that one main cause of that mortality which attended compound fractures of the limbs was the great striving after conservatism, which influenced all the surgeons of the British army.

Primitive operations were the most successful in the French service, and the proportion of their success surpassed sometimes one-half, sometimes two-thirds, the favourable results of consecutive amputations. The experience of the English in favour of early operations was also, according to Macleod, unequivocal, and such as to require no illustration.

The experience of the Crimean war, both in the English and the French armies, is therefore most decidedly in accordance with the teachings of Hennen. This excellent surgeon says: "*The sum of human misery will be most materially lessened by permitting no ambiguous cases to be subjected to the trial of preserving the limb;*" and, moreover, as respects the time of operating, *operate with as little delay as possible*. The Italics are as we find them in the original edition of Hennen's work.

Dr. Scrive makes one exception to the rule of primitive amputation, and that is in the operation at the hip-joint. This he is convinced is always fatal if practised primitively, by which he means within two or three days after the receipt of the wound. In nine cases where it was performed primitively, the patients all died at the time of the operation, a few minutes or a few hours afterwards. In three cases where the operation was performed consecutively, one lived five days, one twelve, and the third twenty, and under better conditions he is satisfied that the patients would have entirely recovered.

Resections were tried a very great number of times. Generally they did not succeed, with the exception of a certain number of those practised upon the upper extremity, and principally the resection of the head of the hu-

merus, which seems to enjoy great privileges in this respect, and to furnish frequent examples of success. All those tried on the lower extremity, even in the diaphysis of the bones, generally failed; and the same is true of the greater part of the trephinations of the cranium. The experience of Macleod in the use of the trephine is the same; of twenty-eight cases in which it was used in the English army, twenty-four died.

Of chloroform, Dr. Scrive says that the benefits derived from its use were immense. Although it was used in thousands of cases, it never caused the slightest serious accident. Not only was it used to obtain complete insensibility in every important operation, but also to render more supportable the pain from wounds altogether desperate, and to calm nervous and irritable persons, the dressing of whose wounds occasioned much suffering. A special apparatus was employed in its administration, by which the dose was exactly measured, and that allowed a proper intermixture of air and chloroform. When insensibility was produced the apparatus was withdrawn; complete relaxation of the muscles was never reached. Given in this way, with reserve and prudence, to insensibility and no further, Dr. Scrive states that, far from adding to the general stupor of a patient severely wounded, it excites favourably the depressed nervous system, rouses up the circulation rendered slow and weak by the general shock, while destroying at the same time the enervating sensation of pain.

Great resistance of the wounded to anæsthesia a day or two after the reception of the injury was frequently remarked. A much larger dose of the chloroform was necessary before insensibility was produced, and the period of excitement was so strongly marked that several men were often required to hold the patient. To avoid this over-excitation produced by traumatism, the rule was observed to amputate as much as possible the very day of the wound. When consecutive amputation was necessary from gradual sinking from suppuration, anæsthesia was effected with the most perfect tranquillity.

We here conclude our task of endeavouring to extract from this valuable work of Dr. Scrive that medical and surgical information which seemed to us most useful and applicable, both directly and indirectly, to our country in the present condition of affairs. We might have made many and most just animadversions in regard to the manner in which the sanitary condition of our volunteer troops has so far been attended to, but all this we leave to others more competent and more willing than ourselves to perform the task.

W. F. A.

ART. XIV.—*A Treatise on Diseases of the Joints.* By RICHARD BARWELL, F. R. C. S., Assistant Surgeon, Charing Cross Hospital, &c. Illustrated by engravings on wood. Philadelphia: Blanchard & Lea, 1861. 8vo. pp. 463, with index.

THE author of this work has admirably satisfied a want which has long been seriously felt—that of a treatise on diseases of the joints, as he expresses it, “equal to or rather beyond the current knowledge of the day.” Some familiarity with the London publication, of which the copy before us is a faithful and handsome reprint, has convinced us that Mr. Barwell’s pages fully justify the modest hope expressed in his preface. Not only do